CLAIMS

1. A hybrid driving unit, comprising:

an input shaft for inputting motive power from an internal combustion engine;

an output shaft disposed on an axis in line with said input shaft and interlocked with driving wheels;

a first electric motor disposed on the axis and having a stator and a rotor;

a power splitting planetary gear disposed on the axis and having a first rotary element coupled with said input shaft, a second rotary element coupled with the rotor of said first electric motor and a third rotary element coupled with said output shaft;

a second electric motor disposed on the axis and having a stator and a rotor; and

a transmission disposed on the axis and shifting and transmitting revolution of the rotor of said second electric motor to said output shaft;

said hybrid driving unit being characterized in that:

said first electric motor, said power splitting planetary gear, said second electric motor and said transmission are stored in a casing member while being disposed in line on the axis;

the stators of said first and second electric motors are fixed to said casing member; and

said first electric motor, said power splitting planetary

gear, said second electric motor and said transmission are disposed on the axis so that said first electric motor and said second electric motor adjoin each other on the axis.

2. The hybrid driving unit as set forth in Claim 1, characterized in that said casing member is built by connecting a plurality of partial cases in a body in the axial direction and said first and second electric motors are stored in one of said partial cases.

3. The hybrid driving unit as set forth in Claim 2, characterized in that said casing member has a joint section of said partial cases at the part where said transmission and said power splitting planetary gear are stored.

4. The hybrid driving unit as set forth in Claim 2, characterized in that said partial case storing said first and second electric motors is divided into a front part close to said internal combustion engine and to a rear part by a partition and the radial size of a motor storage section of the front part is larger than that of a motor storage section of the rear part.

5. The hybrid driving unit as set forth in Claim 4, characterized in that partitions extending from said casing member support the both sides of the rotors of said first and second electric motors through an intermediary of bearing members and said partition between said first electric motor and said second electric motor is utilized in common and has bearing members supporting the rotors of said first and second

electric motors, respectively.

6. The hybrid driving unit as set forth in Claim 5, characterized in that said input shaft is supported by the inner peripheral face of the rotor of said first electric motor through an intermediary of bearing members provided on the outer peripheral face of said input shaft.

7. The hybrid driving unit as set forth in anyone of Claims 1 throough 6, characterized in that said first electric motor, said second electric motor, said transmission and said power splitting planetary gear are disposed in order from the side closer to said internal combustion engine.

8. The hybrid driving unit as set forth in Claim 7, characterized in that said input shaft is coupled with said first rotary element through the inner periphery of said first electric motor, said second electric motor and said transmission, and said output element of said transmission is coupled with said output shaft through the outer periphery of said power splitting planetary gear.

9. The hybrid driving unit as set forth in Claim 8, characterized in that said power splitting planetary gear is composed of a single pinion planetary gear;

said input shaft is coupled with the rear side of a carrier of said single pinion planetary gear through the inner periphery of said power splitting planetary gear;

said output shaft is coupled with said output element of said transmission via a ring gear of said single pinion

planetary gear; and

the rotor of said first electric motor is coupled with a sun gear of said single pinion planetary gear through the inner periphery of said second electric motor and said transmission.

10. The hybrid driving unit as set forth in Claim 8, characterized in that said power splitting planetary gear is composed of the single pinion planetary gear;

said input shaft is coupled with the transmission side of the carrier of said single pinion planetary gear;

said output shaft is coupled with the sun gear of said single pinion planetary gear and with the output element of said transmission through the outer periphery of said power splitting planetary gear; and

the rotor of said first electric motor is coupled with the ring gear of said single pinion planetary gear through the inner periphery of said second electric motor and said transmission.

11. The hybrid driving unit as set forth in Claim 8, characterized in that said power splitting planetary gear is composed of a double pinion planetary gear;

said input shaft is coupled with a ring gear of said double pinion planetary gear through the rear side of said power splitting planetary gear;

said output shaft is coupled with the transmission side of a carrier of said double pinion planetary gear through the

outer periphery of said power splitting planetary gear and with the output element of said transmission; and

the rotor of said first electric motor is coupled with a sun gear of said double pinion planetary gear through the inner periphery of said second electric motor and said transmission.

12. The hybrid driving unit as set forth in Claim 8, characterized in that said power splitting planetary gear is composed of the double pinion planetary gear;

said input shaft is coupled with the ring gear of said double pinion planetary gear through the rear side of said power splitting planetary gear;

said output shaft is coupled with the sun gear of said double pinion planetary gear and with the output element of said transmission through the outer periphery of said power splitting planetary gear and between said power splitting planetary gear and said transmission; and

the rotor of said first electric motor is coupled with the rear side of the carrier of said double pinion planetary gear through the inner periphery of said second electric motor and said transmission.

13. The hybrid driving unit as set forth in anyone of Claims 1 through 6, characterized in that said first electric motor, said second electric motor, said power splitting planetary gear and said transmission are disposed in order from the side closer to said internal combustion engine.

14. The hybrid driving unit as set forth in Claim 13, characterized in that said input shaft is coupled with the first rotary element through the inner periphery of said first electric motor and said second electric motor;

the rotor of said second electric motor is coupled with said transmission through the outer periphery of said power splitting planetary gear; and

said output shaft is coupled with the output element of said transmission and with the third rotary element through the inner periphery of said transmission.

15. The hybrid driving unit as set forth in Claim 14, characterized in that said power splitting planetary gear is composed of the single pinion planetary gear;

said input shaft is coupled with the transmission side of the carrier of said single pinion planetary gear through the inner periphery of said power splitting planetary gear;

said output shaft is coupled with the output element of said transmission and with the ring gear of said single pinion planetary gear through between said power splitting planetary gear and said transmission;

the rotor of said first electric motor is coupled with the sun gear of said single pinion planetary gear through the inner periphery of said second electric motor; and

the rotor of said second electric motor is coupled with an input element of said transmission through the outer periphery of said power splitting planetary gear.

16. The hybrid driving unit as set forth in Claim 14, characterized in that said power splitting planetary gear is composed of the single pinion planetary gear;

said input shaft is coupled with the second electric motor side of the carrier of said single pinion planetary gear;

said output shaft is coupled with the output element of said transmission and with the sun gear of said single pinion planetary gear;

the rotor of said first electric motor is coupled with the ring gear of said single pinion planetary gear through between said second electric motor and said power splitting planetary gear; and

the rotor of said second electric motor is coupled with the input element of said transmission through the outer periphery of said power splitting planetary gear.

17. The hybrid driving unit as set forth in Claim 14, characterized in that said power splitting planetary gear is composed of the double pinion planetary gear;

said input shaft is coupled with the ring gear of said double pinion planetary gear through between said power splitting planetary gear and said transmission;

said output shaft is coupled with the output element of said transmission and with the sun gear of said double pinion planetary gear through between said power splitting planetary gear and said transmission, through the outer periphery of said power splitting planetary gear and through between said

power splitting planetary gear and said second electric motor;

the rotor of said first electric motor is coupled with the transmission side of the carrier of said double pinion planetary gear through the inner peripheral side of said second electric motor and through between said power splitting planetary gear and said transmission; and

the rotor of said second electric motor is coupled with said input element of said transmission through the outer periphery of said power splitting planetary gear.

18. The hybrid driving unit as set forth in Claim 14, characterized in that said power splitting planetary gear is composed of the double pinion planetary gear;

said input shaft is coupled with the carrier of said double pinion planetary gear through between said power splitting planetary gear and said transmission;

said output shaft is coupled with the output element of said transmission and with the ring gear of said double pinion planetary gear through between said power splitting planetary gear and said transmission;

the rotor of said first electric motor is coupled with the sun gear of said double pinion planetary gear through the inner peripheral side of said second electric motor; and

the rotor of said second electric motor is coupled with the input element of said transmission through the outer peripheral side of said power splitting planetary gear.

19. The hybrid driving unit as set forth in anyone of

Claims 1 through 18, characterized in that said transmission has a planetary gear unit.

20. The hybrid driving unit as set forth in Claim 19, characterized in that said transmission has at least four shifting elements, the first shifting element is coupled with the rotor of said second electric motor, the second shifting element is coupled with said output shaft, and said transmission has braking elements which are capable of fixing the third and fourth shifting elements to said casing member, respectively.

21. The hybrid driving unit as set forth in Claim 19, characterized in that said planetary gear of said transmission is composed of a Ravigneaux type planetary gear and a carrier of said Ravigneaux type planetary gear is coupled with said output shaft.

22. The hybrid driving unit as set forth in anyone of Claims 1 through 6, characterized in that said power splitting planetary gear, said first electric motor, said second electric motor and said transmission are disposed in order from the side closer to said internal combustion engine.

23. The hybrid driving unit as set forth in Claim 22, characterized in that said input shaft is coupled with the first rotary element, and the output element of said transmission is coupled with said output shaft disposed through the inner periphery of said power splitting planetary gear, said first electric motor, said second electric motor and said

transmission.

24. The hybrid driving unit as set forth in anyone of Claims 1 through 6, characterized in that said transmission, said second electric motor, said first electric motor and said power splitting planetary gear are disposed in order from the side closer to said internal combustion engine.

25. The hybrid driving unit as set forth in Claim 24, characterized in that said input shaft is coupled with the first rotary element through the inner periphery of said transmission, said second electric motor, said first electric motor and said power splitting planetary gear, and the output element of said transmission is coupled with said output shaft through between said input shaft and the inner periphery of said transmission, said second electric motor, said first electric motor and said power splitting planetary gear.

26. A vehicle comprising an internal combustion engine, hybrid driving means and rear wheels as driving wheels to which driving force is transmitted from said hybrid driving means;

said vehicle being characterized in that:

said hybrid driving means is the hybrid driving unit as set forth in anyone of Claims 1 through 25; and

said hybrid driving unit is arranged such that said input shaft is coupled with an output shaft of said internal combustion engine, a propeller shaft is coupled with said output shaft of said internal combustion engine, and said output shaft of said internal combustion engine, said input shaft, said

output shaft and said propeller shaft are disposed approximately on one and same axis.